UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,105	12/21/2001	Xiaoyun Zhu	10013755 -1	5883

7590 04/27/2007

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
GEREZGIHER, YEMANE M	
ART UNIT	**PAPER NUMBER**
2144	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/032,105	ZHU ET AL.	
	Examiner	Art Unit	
	Yemane M. Gerezgiher	2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The response filed on 02/02/2007 has been entered. Claims 1-8 and 18-22 are now pending in this application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8 and 18-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The applicant recites:

"...the means for assigning using information about which application functional components communicate with each other as a part of assigning the application functional components to the available network resources" (See amended claim 18 and similarly in amended claim 1).

However, such a functional limitation as recited in the claims 1 and 18 is not disclosed or described in the original specification of this instant application. There is no support in the specification that enables the recited functional limitations as amended. No reasonable description of the original specification supports these functional limitations by providing the actual steps of the WHAT and the HOW to make use of the claimed language that recite a claim limitations directed the mapping or assignment process performing the mapping or assigning the application model to the resource model "using information about which application functional components communicate with each other as a part of assigning the application functional components to the available network resources" as recited in the claims. The patent law requires that applicant must disclose his invention in such detail that it will not require undue experimentation for one skill in the art. Applicant did not comply this requirement of the first paragraph. The examiner contends (at the time the invention was made) that it would require undue experimentation for one of ordinary skill in the art of computer networks to make and use the claimed invention for the reasons set forth above. Applicant is reminded that no new matter is allowed in the amendment to the specifications under 35 U.S.C. 132 and 37 CFR 1.118(a).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-8 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. (US 20030028642 A1) hereinafter referred to as Agarwal in view of Forecast et al. (U.S. Patent Number 6,230,200) hereinafter referred to as Forecast.

As per claim 1, Agarwal disclosed a resource assignment method [abstract] comprising: establishing a resource model [Abstract, Page 1, ¶¶0008-0014, Agarwal disclosed resource allocation having therein communication resources. Agarwa disclosed establishing a collection of resource models (server farm), see Page 2, ¶0027]; acquiring an application model, wherein said application model describes a plurality of application functional components and includes information about which application functional components communicate with each other [Agarwal disclosed hosting plurality of applications in a shared virtual server farm, see Page 2, ¶0026-0038]; and utilizing a mapping process to map said application model onto said resource

model [Page 2, ¶0040 through Page 3, ¶0043, Agarwal disclosed mapping plurality of application models to appropriate resources in the virtual server farm. Agarwal disclosed determining the requirement of plurality of applications and based on the determined requirements allocating/mapping sufficient resources to each of the plurality hosted applications (Page 3, ¶0053-0055)], wherein said mapping process is directed to increasing the optimization of resource utilization through appropriate assignment of resources to an application with respect to desired objectives [Page 3, ¶0044-0048, ¶0052].

Agarwal substantially disclosed the limitations as claimed. However, Agarwal was silent about an application model that "describes a plurality of application functional components and includes information about which application functional components communicate with each other". However, as evidenced by the teachings of Forecast, in the same field of invention directed to resource modeling by allocating network resources to the plurality of application, plurality of application components (servers and other functional components) interconnected in a tree structure showing communication channels between the application components was known in the art at the time the invention was made [see Forecast, Abstract, Column 2, Lines 6-51, Fig. 44, Fig. 2, and Column 57, Line 3 (Dynamic Modeling for Resource allocation in a File server) through Column 59, Line 67)]. Thus, it is respectfully submitted that it would have been obvious to one of ordinary skill in the art at the time the invention was made to take the teachings of Forecast related to the

communication structure of functional application components in a tree structure showing which components communicate with one another and have modified the teachings of Agarwal in order to facilitate resource allocation by dynamically controlling imbalance conditions that would occurs as a result of allocation and de-allocation of resources (see Forecast, Abstract and Column 3, Lines 15-20).

As per claim 2, Agarwal disclosed obtaining a set of parameters associated with topology and performance characteristics of resources in a data center [Page 3, ¶0054, Page 8, ¶¶0159-0161, Agarwal disclosed capacity of a machine to support a particular application is measured, Page 4, ¶0077-0078, Agarwal disclosed collecting performance metrics] and; acquiring information about resource requirements of an application [Page 3, ¶0053-0055, benchmarking, Page 4, ¶0076, and Page 6, ¶0126, Page 7, ¶¶0133-0134].

As per claim 3, Agarwal disclosed that said parameters that characterize the topology and resources of said data center include: the number of edge switches, the number of rack switches, the number of server nodes, and connectivity matrices between different layers; and specification of the bandwidth limits of the incoming and outgoing links at various layers of the network [Page 2, ¶¶0026-0039 and Page 3, ¶¶0048-54, Page 8, ¶¶0163-0165, Agarwal disclosed plurality resources including all conventional network

elements and disclosed analyzing incoming and outgoing links rates associated with plurality of application models for purposes of optimal resource allocation to the plurality of applications].

As per claim 4, Agarwal disclosed a number of application functional components [Page 3, ¶0058]]; the network traffic requirements between said application functional components [Page 2, 0040 and Page 3, ¶0048]; and upper and lower bounds on server attributes which are required for said server to host said application functional component [Page 3, ¶¶0053-0055, Page 2, ¶¶0040-0042].

As per claim 5, Agarwal disclosed mapping process determining which server nodes are assigned to an application functional component and is captured in an assignment decision variable [Abstract, "...record is maintained of the resources currently allocated and resources currently consumed for each combination of instance and user, in terms of load factors placed on the instances by requests serviced by those instances of the application or its components..." see also Page 6, ¶¶0111-0115].

As per claim 6, Agarwal disclosed that assignment decision variable is optimized in accordance with a desired objective including meeting application requirements [Page, 1, ¶¶0011-0015, Page 2, ¶0040 and Page 3, ¶0044].

As per claim 7, Agarwal disclosed that the desired objective further includes minimizing communication delays [Page 1, 0014 and Page 2, ¶0040, Agarwal disclosed dynamic resource allocation to plurality of hosted application involving load balancing and optimized resource allocation that meet application requirements].

As per claim 8, Agarwal disclosed a layered partitioning and pruning (LPP) process is utilized to find an application resource assignment optimal solution [Page, 13, ¶0280, Agarwal disclosed partitioning in optimizing the resource allocation process].

As per claim 18, Agarwal disclosed a resource allocation system [Abstract, Page 1, ¶¶0008-0014, Agarwal disclosed resource allocation system having therein communication resources. Agarwa disclosed establishing a collection of resource models (server farm), see Page 2, ¶0027]; comprising: a means for gathering information associated with available networked resources [Page 3, ¶0054, Page 8, ¶¶0159-0161, capability of a machine/resource to support a particular application is measured]; a means for extracting information associated with application functional components [Page 2, 0040 and Page 3, ¶0048]; and a means for assigning application functional components to said available networked resources in accordance with a resource allocation variable [Page 2, ¶0040 through Page 3, ¶0043, Agarwal disclosed mapping plurality of application models to appropriate resources in

the virtual server farm. Agarwal disclosed determining the requirement of plurality of applications and based on the determined requirements allocating/mapping sufficient resources to each of the plurality hosted applications (Page 3, ¶0053-0055)].

Agarwal substantially disclosed the limitations as claimed. However, Agarwal was silent to disclose "the means for assigning using information about which application functional components communicate with each other as a part of assigning the application functional components to the available network resources". However, as evidenced by the teachings of Forecast, in the same field of invention, which is directed to resource modeling by allocating network resources to the plurality of application components (servers and other functional components including stream servers, file servers storage servers) interconnected in a tree structure showing communication channels between the application components in allocating/mapping resources accordingly was known in the art at the time the invention was made [see Forecast, Abstract, Column 2, Lines 6-51, Fig. 44, Fig. 2, and Column 57, Line 3 (Dynamic Modeling for Resource allocation in a File server) through Column 59, Line 67)]. Thus, it is respectfully submitted that it would have been obvious to one of ordinary skill in the art at the time the invention was made to take the teachings of Forecast related to the communication structure of functional application components in a tree structure showing which components communicate with one another and have modified the teachings of Agarwal in

order to facilitate resource allocation by dynamically controlling imbalance conditions that would occurs as a result of allocation and de-allocation of resources (see Forecast, Abstract and Column 3, Lines 15-20).

As per claim 19, Agarwal disclosed allocating said available networked resources by maximizing said available networked resources identified in said resource allocation variable with respect to application constraints and desired objectives [Page, 1, ¶¶0011-0015, Page 2, ¶0040 and Page 3, ¶0044].

As per claim 20, Agarwal further disclosed configuration and performance characteristics of said available networked resources [Page 3, ¶0054, Page 8, ¶¶0159-0161, Agarwal disclosed capacity of a machine to support a particular application is measured, Page 4, ¶0077-0078, Agarwal disclosed collecting performance metrics].

As per claim 21, Agarwal further disclosed organization and networked resource requirements of said application functional components [Page 3, ¶0053-0055, benchmarking, Page 4, ¶0076, and Page 6, ¶0126, Page 7, ¶¶0133-0134].

As per claim 22, Agarwal further disclosed a means for simplifying said assignment analysis by identifying infeasible networked resources and partitioning said available networked resources [Page, 13, ¶0280, Agarwal disclosed partitioning in optimizing the resource allocation process and on Page

13, ¶0284 and ¶0288, Agarwal further disclosed identifying "infeasible" (i.e. unused or exhausted resources and resources not properly functioning by reclaiming and further dynamically allocating available resources].

Response to Arguments

6. Applicant's arguments with respect to claims 1 and 18 have been considered but are moot in view of the new ground(s) of rejection.

However, examiner likes to address the allegation (i.e., Agarwal teaches away of managing resources for hosted applications) by pointing to an arbitrary section of the applied prior art of record reciting "Agarwal focuses on small clients where a single machine can be used simultaneously for multiple clients..." (See Applicants Remark on Page 6, ¶4-6).

→ The Examiner respectfully disagrees. This additional positive limitation pointed out by the inventive entity, does not "teach away" the claimed invention in any way. In fact it only additionally provide additional positive limitation as noted by the inventive entity. Furthermore, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." In re Fulton, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

→ The Examiner notes that the claims breadth allows multiple interpretations and meanings, which are broader than Applicant's disclosure. The Examiner is forced to interpret the claim limitations as broadly and as reasonably possible, in determining patentability of the disclosed invention. Thus, Applicant apparently intends that a broad interpretation be given to the claims and the Examiner has adopted such in the present and previous Office action rejections. See In re Prater and Wei, 162 USPQ 541 (CCPA 1969), and MPEP 2111.

→ It is the Examiner's position that Applicant has not yet submitted claims drawn to limitations, which define the operation of Applicant's disclosed invention in manner, which distinguishes over the prior art. As it is Applicant's right to continue to claim as broadly as possible. However, it is also the Examiner's right to continue to interpret the claim language reasonably as broadly as possible. It is the Examiner's position that the detailed functionality that allows for Applicant's invention to overcome the prior art used in the rejection has not been claimed, what is actually claimed fails to differentiate in detail how these features are unique over the applied prior art of record. For instance looking at claim 1 as recited, the inventive entity recites notoriously broad language including a resource model, an application model describing plurality of application functional components and mapping process mapping the application model onto the resource model and further recites a non further limiting language ("wherein said mapping process is directed to

increasing the optimization of resource utilization..."), which is not given a patentable weight as it is simply expressing the intended use or result of the process.

Note: If further prosecution on the merits of the instant application is pursued, Applicant is strongly encouraged to further incorporate into the independent claims extensive details or features (if any) of this instant application to at least overcome the applied prior art of record.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yemane M. Gerezgiher whose telephone number is (571) 272-3927. The examiner can normally be reached on 9:00 AM - 6:00 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William C. Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner,
Y. Gerezgiher
AU: 2144

WILLIAM VAUGHN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100